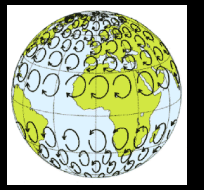
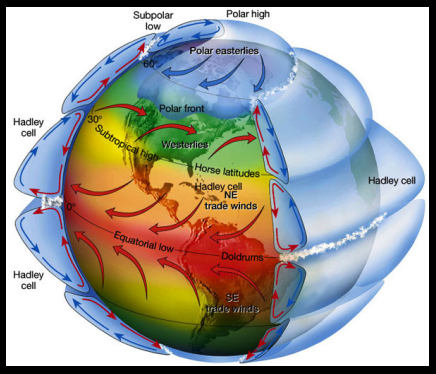
Currents

The ocean has a few key forces that play on the movement of water.

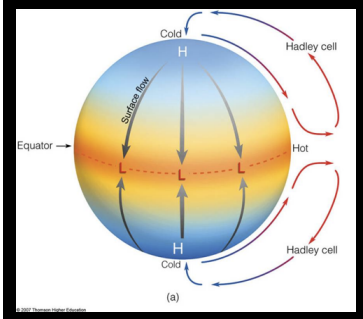
Temperature
Wind
Salinity
Gravity
and some natural phenomena: earthquakes, tsunamis, hurricanes

Coriolis Effect





scishow

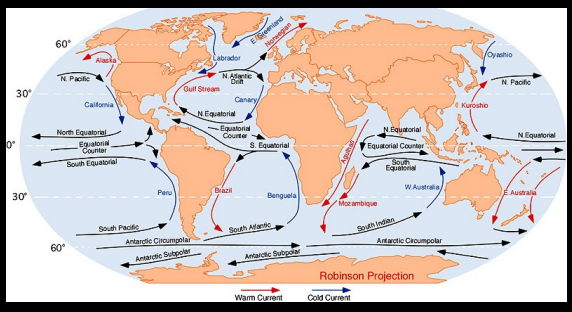


Hadley Cells are the low-latitude (equatorial) overturning circulations that have air rising at the equator and air sinking at roughly 30° latitude. They are responsible for the trade winds in the Tropics.

Hadley cells create winds that help with surface current circulation

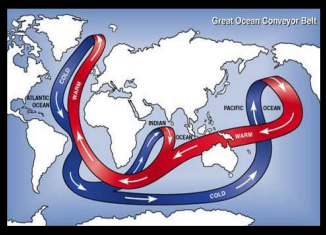
Currents

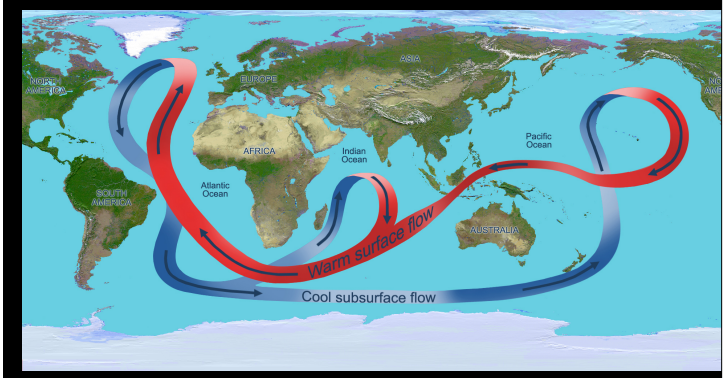
- What are currents?
- "Rivers" of circulating water
- Causes
- Wind
- Rotating Earth
- Density Changes
- Broad, slow drifts; never cross equator

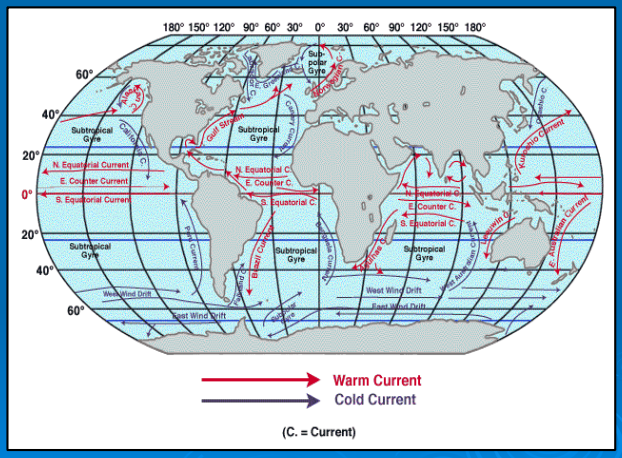


Deep Ocean Currents

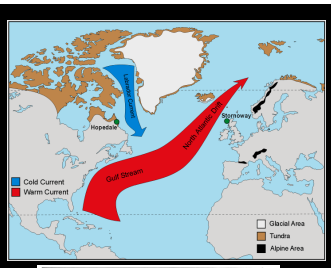
- Flow beneath surface; cross equator
- Move North to South
- Separated from surface currents by boundary called a "Thermohaline" (diff in densities)

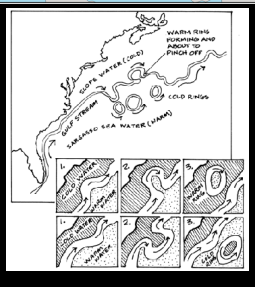






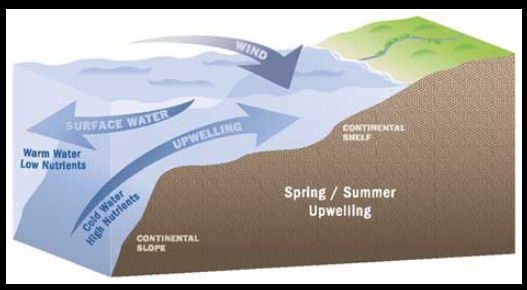
- Gulf Stream
  - N. Atlantic
  - Brings warm water from equator north along east coast of N. A.
  - Sometimes form eddies – circulating water that pinches off from the current





Importance Of Deep Currents

- **Upwelling**
  - **Brings deep water to surf.**
  - **Circulates nutrients up**
  - **Moves plankton & larvae**



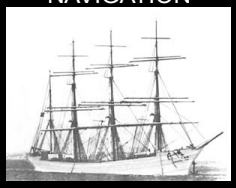
Upwelling vs Downwelling

Upwelling occurs in the open ocean and along coastlines. The reverse process, called downwelling, also occurs when wind causes surface water to build up along a coastline. The surface water eventually sinks toward the bottom.

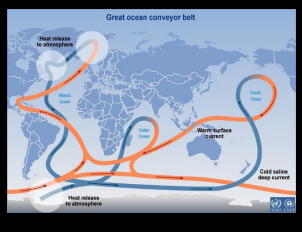
IMPORTANCE OF SURF. CURRENTS

MIGRATION

NAVIGATION



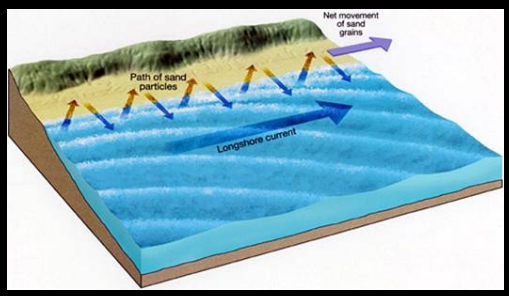
WEATHER



Localized Surface Currents

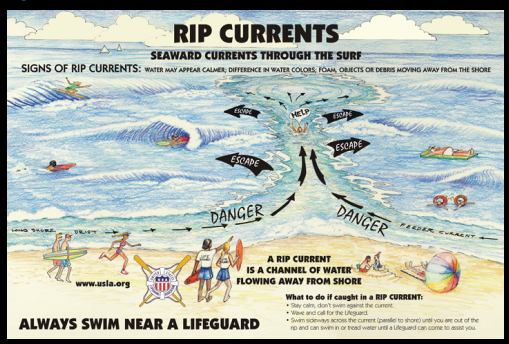
Longshore Current.

- **Flows parallel to shore; move sediment**



RIP CURRENT

- **Caused by converging longshore currents**
- **Very dangerous ; Red Flag**
- **DO NOT fight rip current; swim parallel to shore to get out of channel**



7 things we don't know about the ocean